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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,133	06/27/2003	Masuhiko Natsuhara	039.0017	1132

29453      °      7590      06/22/2007  
JUDGE & MURAKAMI IP ASSOCIATES  
DOJIMIA BUILDING, 7TH FLOOR  
6-8 NISHITEMMA 2-CHOME, KITA-KU  
OSAKA-SHI, 530-0047  
JAPAN

EXAMINER

KACKAR, RAM N

ART UNIT	PAPER NUMBER
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1763

MAIL DATE	DELIVERY MODE
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06/22/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/604,133

Applicant(s)

NATSUHARA ET AL.

Examiner

Ram N. Kackar

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 14 May 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 5/11/07.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

**Claims 5 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.**

In claim 5 recitation of “heat capacity of each of the plurality of electrodes is 1% or less of the heat capacity of the region of the wafer holder that corresponds to inside the outer periphery of the shaft” is a new matter since the specification is concerned with total heat capacity of electrodes and not heat capacity per electrode (Paragraph 20 of the specification - US Publication 2004/0187789).

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

In theses claims the limitation of heat capacity of electrodes is indefinite since the heat capacity of electrode depends upon its length while length of the electrodes is indefinite.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Araki et al (US 6239402) in view of Ohashi et al (US 6261708) as evidenced by Soma et al (US 5231690) and also further in view of Yasutaka Ito (JP 2002-249377).**

Araki et al disclose an Aluminum Nitride based wafer holder for semiconductor manufacturing device (Fig 9) with a shaft diameter less than the diameter of the substrate holder (34) and an electrical circuit formed inside (7 for resistive heating and 9 for plasma) and electrodes for supplying power (12, 13 and 14). The heat capacity of the electrodes could be fairly estimated to be less than 2 J/gK, since compared to the claimed invention the wire (electrodes) number is 3 and length less than 40mm. So that heat capacity per electrode would be less than 0.66 J/gK.

This estimation depends upon the typical diameter of power supplying electrodes being 4mm. Typical diameter as taught by Soma et al is 2mm (Col 6 lines 7-10). It may be fairly estimated that even if the diameter is several times that of Soma et al the heat capacity of electrodes will not be more than 5 J/gK.

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The heat capacity of the wafer holder however could be fairly estimated to be more than 350 J/gK. Therefore the heat capacity of the electrodes of the disclosed wafer holder would be much less than 10% in fact much less than 1% per electrode.

Further Araki et al do not disclose the degree of roughness of the surfaces of the shaft and the wafer holder.

Ohashi et al teach a method of joining a shaft and a wafer holder and teach that respective surfaces are smoothed to less than 2  $\mu\text{m}$  (Col 10 lines 22-28) for airtight joining.

Therefore it would have been obvious for one of ordinary skill in the art at the time of invention to have smooth joining surface for a good joint.

Regarding the limitation of the electrodes length, in this instance electrodes are understood to be the conductor from the electrical circuit to the power supply and would be configured according to component placements and process needs and would therefore be obvious to be optimized.

Further, references disclosed by the applicant in IDS specially Yasutaka Ito, recommend low heat capacity (Paragraph 9-10) and explain that large heat capacity increases the amount of heat required to raise the temperature. Therefore it would be obvious to optimize the heat capacity of the electrodes with respect to the wafer holder since regions with large heat capacity will have less comparative temperature and low temperature uniformity.

***Response to Arguments***

Applicant's arguments filed 5/14/2007 have been fully considered but they are not persuasive.

Applicant's argument against the 35 U.S.C. 112 rejection of claim 5 is not persuasive since the specification is concerned with total heat capacity of electrodes and not heat capacity per electrode. Applicant's other arguments are also addressed in the rejection.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N. Kackar whose telephone number is 571 272 1436. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571 272 1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ram Kackar  
Primary Examiner AU 1763